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The potential of insects and microalgae in a biobased economy

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In our modern society there is a great need for the production of food, feed and raw materials from alternative sources of biomass. In the search for answers to the future food challenges and for sustainable production of raw materials, insects and microalgae offer excellent opportunities. Thomas More provides, in cooperation with KU Leuven, multidisciplinary research on the growth and use of insects and microalgae for various applications.

Both insects and microalgae possess numerous of interesting properties to serve as resources in a biobased economy. Insects are omnivorous animals with a high fecundity. They can be reared easily on a relatively small surface. They feature excellent feeding conversions and can be grown on organic side streams obtained from industry and farming. Additionally, insects are high value biomass, considering their protein and lipid composition and the presence of chitin.
Microalgae are another promising source for a sustainable supply of high-value biomolecules such as fatty acids, anti-oxidants, vitamins and essential amino acids which can be used as food additives, cosmetics and pharmaceuticals as well as in aquaculture, feed and the chemical industry. Algae doesn't require fertile farmland, they can be cultivated in salt water not suitable for drinking and they are able to process various aqueous side streams and flue gases.

In Thomas More, research on insects as well as algae is performed on both laboratory scale and pilot scale. The insect research focuses on testing the processing of different organic side streams with different insect species. The effect of the different diets on the nutritional composition of the insects can be further investigated. Moreover, different compounds can be extracted, both on laboratory scale and pilot scale. Together with the industry, we look for interesting applications in the chemical and pharmaceutical industry. Currently, Thomas More, together with KU Leuven, investigates also the possibilities to process insects into human food and as a protein source in broiler feed.
The algae research focuses on the optimization of the cultivation conditions for different algae strains, to stimulate different metabolic pathway, to valorize different side streams and above all to obtain a sustainable and economic viable production process with high yields. Research is performed in the laboratory and in pilot photobioreactors which are installed in a greenhouse on the Thomas More site in Geel.